FORM PTO-1390 (Modified) (REV 11-98) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET NUMBER: **112740-241**

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR): **09/869952**

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/EP00/00051	**05 January 2000**	**11 January 1999**

TITLE OF INVENTION

INFORMATION ELEMENT COMPONENT OF A SIGNALING MESSAGE, AND A METHOD FOR CONNECTION CONTROL USING SAME

APPLICANT(S) FOR DO/EO/US

Rainer Stademann

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
   a. ☒ is transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☐ has been transmitted by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ A copy of the International Search Report (PCT/ISA/210).
8. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
   a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☐ have been transmitted by the International Bureau.
   c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
   d. ☒ have not been made and will not be made.
9. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
10. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
11. ☒ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).

Items 13 to 20 below concern document(s) or information included:

13. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☒ A **FIRST** preliminary amendment.
16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
17. ☒ A substitute specification.
18. ☐ A change of power of attorney and/or address letter.
19. ☒ Certificate of Mailing by Express Mail
20. ☒ Other items or information:

Submission of Drawings Figures 1-5 on five sheets

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR)	INTERNATIONAL APPLICATION NO.	ATTORNEY'S DOCKET NUMBER
09/869952	PCT/EP00/00051	112740-241

21. The following fees are submitted:.

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :

		CALCULATIONS PTO USE ONLY
☐	Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2) paid to USPTO and International Search Report not prepared by the EPO or JPO **$1,000.00**	
☒	International preliminary examination fee (37 CFR 1.482) not paid to USPTO but Internation Search Report prepared by the EPO or JPO **$860.00**	
☐	International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO **$710.00**	
☐	International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) **$690.00**	
☐	International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) **$100.00**	
	ENTER APPROPRIATE BASIC FEE AMOUNT =	**$860.00**
	Surcharge of **$130.00** for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).	**$0.00**

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	
Total claims	8 - 20 =	0	x $18.00	**$0.00**
Independent claims	6 - 3 =	3	x $80.00	**$240.00**
Multiple Dependent Claims **(check if applicable).**			☐	**$0.00**
	TOTAL OF ABOVE CALCULATIONS =			**$1,100.00**
	Reduction of 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28) **(check if applicable).** ☐			**$0.00**
	SUBTOTAL =			**$1,100.00**
	Processing fee of **$130.00** for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (f)). +			**$0.00**
	TOTAL NATIONAL FEE =			**$1,100.00**
	Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) **(check if applicable).** ☐			**$0.00**
	TOTAL FEES ENCLOSED =			**$1,100.00**
			Amount to be: refunded	$
			charged	$

☒ A check in the amount of **$1,100.00** to cover the above fees is enclosed.

☐ Please charge my Deposit Account No. in the amount of to cover the above fees.
A duplicate copy of this sheet is enclosed.

☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. **02-1818** A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

William E. Vaughan (Reg. No. 39,056)
Bell, Boyd & Lloyd LLC
P.O. Box 1135
Chicago, Illinois 60690

SIGNATURE

William E. Vaughan
NAME

39,056
REGISTRATION NUMBER

July 9, 2001
DATE

BOX PCT

IN THE UNITED STATES ELECTED/DESIGNATED OFFICE
OF THE UNITED STATES PATENT AND TRADEMARK OFFICE
UNDER THE PATENT COOPERATION TREATY-CHAPTER II

PRELIMINARY AMENDMENT

APPLICANTS:	Rainer Stademann	DOCKET NO: 112740-241
SERIAL NO:		GROUP ART UNIT:
		EXAMINER:
INTERNATIONAL APPLICATION NO:		PCT/EP00/00051
INTERNATIONAL FILING DATE:		05 January 2000
INVENTION:	INFORMATION ELEMENT COMPONENT OF A SIGNALING MESSAGE, AND A METHOD FOR CONNECTION CONTROL USING SAME	

Assistant Commissioner for Patents,
Washington, D.C. 20231

Sir:

Please amend the above-identified International Application before entry into the National stage before the U.S. Patent and Trademark Office under 35 U.S.C. §371 as follows:

In the Specification:

Please replace the Specification of the present application, including the Abstract, with the following Substitute Specification:

SPECIFICATION

TITLE

INFORMATION ELEMENT COMPONENT OF A SIGNALING MESSAGE, AND A METHOD FOR CONNECTION CONTROL USING SAME

BACKGROUND OF THE INVENTION

Field of the Invention:

The present invention relates, generally, to an information element component of a signaling message and a method for connection control using such information element and, more specifically, to such an information element and method wherein an operator is able to introduce new services and/or service features into a network without such services and features needing to already have been provided in advance.

Description of the Prior Art

In today's communication networks, such as the telephone network, many (connection-related) services or service features can be introduced only by virtue of a complex change of software in the exchanges (APS change). In many cases, the reason for this is, among other things, that services and service features require alteration of the signaling between the exchanges (interoffice signaling). This change includes extending existing information elements and introducing new information elements or even new messages. However, since the association between an information element of a signaling message and one or more services or service features is stipulated via the APS, the cited change cannot be made without a change of APS.

A previous solution for introducing new service features into a network (without changing the APS in the VST) is to use the IN (Intelligent Network) architecture. For many service features, however, an IN solution is not possible or is too expensive.

The present invention is, therefore, directed toward permitting an operator to be able to introduce new services and/or service features into the network without them needing to have already been provided in advance in the APS by the manufacturer of the exchanges.

SUMMARY OF THE INVENTION

Accordingly, in an embodiment of the present invention, an information element component of a signaling message used for signaling between exchanges in a communication network is provided, which includes: an administration component via which services for which the information

element is used can be stipulated during operation; and content values which can be at least one of evaluated and altered, based on a preset value made using the administration component, within the context of processing a connection by an exchange.

In an embodiment, the administration component makes the stipulation by embedding a respective information item for at least one bit position of the information element as a control information item into a connection control of the exchange.

In another embodiment of the present invention, a method is provided for connection control in a communication network wherein the method includes the steps of: using an information element of a signaling message for signaling between exchanges in the communication network; stipulating, during operation, services for which the information element is used; stipulating, during operation, services for which the information element is used; and altering content values of the information element, based on an administrative preset, within the context of processing a connection by an exchange.

In an embodiment of the method, the step of stipulating includes prescribing a respective information item for at least one bit position of the information element as control information for a connection control of the exchange.

In a further embodiment of the present invention, an administration component of an information element of a signaling message used for signaling between exchanges in a communication network is provided, which includes characteristics by which the administration component can be used to impress on a connection control of an exchange, during operation, services for which the information element is used.

In an embodiment, a network operator can use the administration component to embed into a connection control, at prescribed locations, functions which can at least one of alter and evaluate content values of the information element.

In another embodiment of the present invention, a method is provided for connection control in an exchange of a communication network, wherein manipulator functions can be impressed administratively on the connection control at particular execution locations, the manipulator functions prompting actions which can at least one of alter and evaluate content values of information elements of signaling messages.

In yet another embodiment of the present invention, an exchange in a communication network is provided which includes a manipulator function which can be programmed using an administration component, so as to permit the connection control to be influenced administratively.

Additional features and advantages of the present invention are described in, and will be apparent from, the following detailed description of the preferred embodiments and the drawing.

DESCRIPTION OF THE DRAWINGS

Figs. 1-3 show in schematic form a "supersave tariff" service which can be provided, by way of example, pursuant to the teachings and implementation of the present invention; and

Figs. 4-5 show other services and service features which can be provided by using the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention provides for the introduction of one or more generic information elements into (signaling) messages for interoffice signaling, the messages being exchanged in the context of the connection control between the exchanges in a communication network. The functional significance of a generic information element (GIE) is not stipulated by the APS. This is how GIEs differ from normal nongeneric information elements. By way of example, a generic information element (GIE) can be provided for this purpose in the connection setup message IAM from the ISUP (cf. Figure 2). Such a GIE may include a (bit) strip of 8, 16, 24 or more bits, for example.

Setup and cleardown of connections is controlled in an exchange by the software program for connection control (part of the APS). So that the operator is able to introduce new service features and/or services into the network without changing the APS, the following functions for processing and evaluating the GIE and for influencing the connection control are provided in addition to the GIE in the exchanges in the network:

a) a write function which connection-related messages can use to write information to the GIE (e.g., setting of individual bits in a bit strip)

b) a read function which connection-related messages can use to specifically read information from the GIE (e.g., testing of individual bits in a bit strip)

c) an administration component which the network operator can use to influence the connection control of a VST.

This administration component can be used by the network operator to embed "manipulator functions" into the connection control at prescribed locations ("points in call", e.g. before or after the digit analysis of the destination telephone number). A manipulator function includes a condition part and an action part.

By way of example, the condition part uses the read function b) to permit the contents of the GIE to be tested for prescribed values. For example, it would be possible to test whether a particular bit (e.g., bit #1) in the GIE of a received connection-related message (e.g., IAM from the ISUP) is set. Furthermore, states of the exchange or states of the connection can be tested in the condition part. For example, it would be possible to test whether the origin of a call is national or international.

The action part of a manipulator function is executed by the APS of the exchange if the condition prescribed in the condition part has been satisfied. Optionally, the action part may itself, in turn, contain complete manipulator functions (interleaving). The action part can be used to alter states of the connection and/or states of the exchange. In this way, the action part

influences the connection control. Like the condition part, the action part is stipulated administratively by the network operator.

One example of a specific action is activation of the above write function a) for a GIE containing prescribed information. Another action may be the release of the connection, for example.

Examples of configurations of manipulator functions are described by the following:

- if service code 0144 is dialed, set bit #1 in the GIE of the IAM message for this call (write function) and use tariff T (cf. service example in Figure 1 to Figure 3).

- If bit #1 in the GIE of the IAM message of a call is set (read function), use only direct channels and, in this context, use line reservation parameter TR=10 (cf. service example in Figure 1 to Figure 3).

- If a call arrives via line group with identifier W, and bit #1 in the GIE of the IAM is set, release the call and set bit #1 in the GIE of the release message (cf. Figure 4).

- If a call arrives via access in the company XYZ, set bit #2 in the GIE of the IAM for this call (cf. Figure 5).

The manipulator functions (and bit positions used therein) involved in providing a service implicitly stipulate that service or service feature for which a particular bit position is used. In this way, the whole GIE can be used for a number of services and/or service features.

The cited manipulator functions can be administered in a user-friendly manner by the network operator,; e.g., using a programming language (cf. example in Figure 3, for example). This allows the network operator to provide new services and/or service features in the network, without them needing to have already been provided in advance by the manufacturer of the exchanges.

The administrability of the cited manipulator functions in an exchange thus makes it possible

a) to have information written flexibly into generic information elements in the interoffice signaling in a VST on the basis of state conditions of the VST and of the respective connection, and

b) to evaluate information from generic information elements of the interoffice signaling in a VST and to logically combine it flexibly with actions on the basis of state conditions of the VST and of the respective connection.

Figures 1-3 show a "supersave tariff" service which can be provided, by way of example, using the present invention. By first dialing the service identifier 0144, a call is routed only via the cheapest channel. The likelihood of blocking is therefore greater than for other calls. In addition, a high trunk reservation parameter ensures that no "valuable" traffic is driven out of the network. By way of compensation, 0144 calls are charged for on the basis of a cheaper tariff T, on the other hand.

Other services and service features which can be provided using the present invention are shown in Figures 4 and 5.

In summary, the following can be reiterated:

The present invention uses generic information elements GIE which can be flexibly allocated to new service features; i.e., it is possible to administratively stipulate for a GIE, without any change of APS, those further new services or service features to be added for which the GIE or parts of the GIE (e.g., individual bit positions) is/are used. The effect achieved by this is that it is not necessary to change the protocol for interoffice signaling.

The present invention makes it possible to provide a category of services which require information to be exchanged between the exchanges, and connection control to be influenced by the exchanges themselves.

The present invention allows the connection control of a VST to be influenced without changing the APS, i.e. during operation of the VST, and thereby makes it possible to introduce new connection-related services or service features.

Although the present invention has been described with reference to specific embodiments, those of skill in the art will recognize the changes may

be made thereto without department from the spirit and scope of the present invention as set forth in the hereafter appended claims.

ABSTRACT OF THE DISCLOSURE

The present invention is directed toward permitting an operator to be able to introduce new services and/or service features into his/her network without them needing to have already been provided in advance in the software system of the exchanges by the manufacturer of the exchanges. Disclosed is an information element of a signaling message which is designed such that the services or service features for which it is used can be stipulated during operation using an appropriate administration component.

In the claims:

On page 7, cancel line 1, and substitute the following left-hand justified heading therefor;

I Claim as My Invention:

Please cancel claims 1-8, without prejudice, and substitute the following claims therefor:

9. An information element component of a signaling message used for signaling between exchanges in a communication network, comprising:

an administration component via which services for which the information element is used can be stipulated during operation; and

content values which can be at least one of evaluated and altered, based on a preset value made using the administration component, within the context of processing a connection by an exchange.

10. An information element component of a signaling message used for signaling between exchanges in a communication network as claimed in claim 9, wherein the administration component makes the stipulation by embedding a respective information item for at least one bit position of the information element as a control information item into a connection control of the exchange.

11. A method for connection control in a communication network, the method comprising the steps of:

using an information element of a signaling message for signaling between exchanges in the communication network;

stipulating, during operation, services for which the information element is used; and

altering content values of the information element, based on an administrative preset, within the context of processing a connection by an exchange.

12. A method for connection control in a communication network as claimed in claim 11, wherein the step of stipulating includes prescribing a respective information item for at least one bit position of the information element as control information for a connection control of the exchange.

13. An administration component of an information element of a signaling message used for signaling between exchanges in a communication network, comprising characteristics by which the administration component can be used to impress on a connection control of an exchange during operation, services for which the information element is used.

14. An administration component of an information element of a signaling message used for signaling between exchanges in a communication network, comprising characteristics by which the administration component can be used by a network operator to embed into a connection control, at prescribed locations, functions which can at least one of alter and evaluate content values of the information element.

15. A method for connection control in an exchange of a communication network, the method comprising the steps of:

impressing manipulator functions administratively on the connection control at particular execution locations; and

prompting actions via the manipulator functions which can at least one of alter and evaluate content values of information elements of signaling messages.

16. An exchange in a communication network comprising:

a manipulator; and

an administration component for programming a function of the manipulator, wherein connection control is permitted to be influenced administratively.

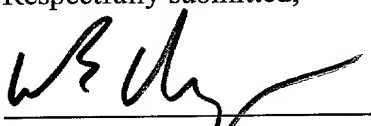
REMARKS

The present amendment makes editorial changes and corrects typographical errors in the specification, which includes the Abstract, in order to conform the specification to the requirements of United States Patent Practice. No new matter is added thereby. Attached hereto is a marked-up version of the changes made to the specification by the present amendment. The attached page is captioned "**Version With Markings To Show Changes Made**".

In addition, the present amendment cancels original claims 1-8 in favor of new claims 9-16. Claims 9-16 have been presented solely because the revisions be red-lining and underlining which would have been necessary in claims 1-8 in order to present those claims in accordance with preferred United States Patent Practice would have been too extensive, and thus would have been too burdensome. The present amendment is intended for clarification purposes only and not for substantial reasons related to patentability pursuant to 35 USC §§103, 102, 103 or 112. Indeed, the cancellation of claims 1-8 does not constitute an intent on the part of the Applicants to surrender any of the subject matter of claims 1-8.

Early consideration on the merits is respectfully requested.

Respectfully submitted,



(Reg. No. 39,056)

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(312) 807-4292
Attorneys for Applicants

VERSIONS WITH MARKINGS TO SHOW CHANGES MADE

In The Specification:

The Specification of the present application, including the Abstract, has been amended as follows:

SPECIFICATION

TITLE

INFORMATION ELEMENT COMPONENT OF A SIGNALING MESSAGE, AND A METHOD FOR CONNECTION CONTROL USING SAME

~~Description~~

~~Information element component of a signaling message~~

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates, generally, to an information element component of a signaling message and a method for connection control using such information element and, more specifically, to such an information element and method wherein an operator is able to introduce new services and/or service features into a network without such services and features needing to already have been provided in advance.

Description of the Prior Art

In today's communication networks, such as the telephone network, many (connection-related) services or service features can be introduced only by virtue of a complex change of software in the exchanges (APS change). In many cases, the reason for this is, among other things, that services and service features require alteration of the signaling between the exchanges (interoffice signaling). This change includes extending existing information elements and introducing new information elements or even new messages. However, since the association between an information element of a signaling message and one

or more services or service features is stipulated ~~by means of~~ via the APS, the cited change cannot be made without a change of APS.

A previous solution for introducing ~~particular~~ new service features into a network (without changing the APS in the VST) is to use the IN (Intelligent Network) architecture. For many service features, however, an IN solution is not possible or is too expensive~~, however~~.

The present invention is, therefore, directed toward ~~based on the object of~~ permitting an operator to be able to introduce new services and/or service features into the network without them needing to have already been provided in advance in the APS by the manufacturer of the exchanges.

~~This object is achieved by an information element component in accordance with claim 1 and by a method in accordance with claim 3. An exemplary embodiment of the invention is explained in more detail below with reference to the drawing, the drawing comprising five figures.~~

SUMMARY OF THE INVENTION

Accordingly, in an embodiment of the present invention, an information element component of a signaling message used for signaling between exchanges in a communication network is provided, which includes: an administration component via which services for which the information element is used can be stipulated during operation; and content values which can be at least one of evaluated and altered, based on a preset value made using the administration component, within the context of processing a connection by an exchange.

In an embodiment, the administration component makes the stipulation by embedding a respective information item for at least one bit position of the information element as a control information item into a connection control of the exchange.

In another embodiment of the present invention, a method is provided for connection control in a communication network wherein the method includes the steps of: using an information element of a signaling message for signaling between exchanges in the communication network; stipulating,

during operation, services for which the information element is used; stipulating, during operation, services for which the information element is used; and altering content values of the information element, based on an administrative preset, within the context of processing a connection by an exchange.

In an embodiment of the method, the step of stipulating includes prescribing a respective information item for at least one bit position of the information element as control information for a connection control of the exchange.

In a further embodiment of the present invention, an administration component of an information element of a signaling message used for signaling between exchanges in a communication network is provided, which includes characteristics by which the administration component can be used to impress on a connection control of an exchange, during operation, services for which the information element is used.

In an embodiment, a network operator can use the administration component to embed into a connection control, at prescribed locations, functions which can at least one of alter and evaluate content values of the information element.

In another embodiment of the present invention, a method is provided for connection control in an exchange of a communication network, wherein manipulator functions can be impressed administratively on the connection control at particular execution locations, the manipulator functions prompting actions which can at least one of alter and evaluate content values of information elements of signaling messages.

In yet another embodiment of the present invention, an exchange in a communication network is provided which includes a manipulator function which can be programmed using an administration component, so as to permit the connection control to be influenced administratively.

Additional features and advantages of the present invention are described in, and will be apparent from, the following detailed description of the preferred embodiments and the drawing.

DESCRIPTION OF THE DRAWINGS

Figs. 1-3 show in schematic form a "supersave tariff" service which can be provided, by way of example, pursuant to the teachings and implementation of the present invention; and

Figs. 4-5 show other services and service features which can be provided by using the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention provides for the introduction of one or more generic information elements into (signaling) messages for interoffice signaling, ~~said~~ the messages being exchanged in the context of the connection control between the exchanges in a communication network. The functional significance of a generic information element (GIE) is not stipulated by the APS. This is how GIEs differ from normal nongeneric information elements. By way of example, a generic information element (GIE) can be provided for this purpose in the connection setup message IAM from the ISUP (cf. ~~F~~figure 2). Such a GIE may ~~comprise~~ include a (bit) strip of 8, 16, 24 or more bits, for example.

Setup and cleardown of connections is controlled in an exchange by the software program for connection control (part of the APS). So that the operator is able to introduce new service features and/or services into the network without changing the APS, the following functions for processing and evaluating the GIE and for influencing the connection control are provided in addition to the GIE in the exchanges in the network:

a) a write function which connection-related messages can use to write information to the GIE (e.g., setting of individual bits in a bit strip)

b) a read function which connection-related messages can use to specifically read information from the GIE (e.g., testing of individual bits in a bit strip)

c) an administration component which the network operator can use to influence the connection control of a VST.

This administration component can be used by the network operator to embed "manipulator functions" into the connection control at prescribed locations ("points in call", e.g. before or after the digit analysis of the destination telephone number). A manipulator function ~~comprises~~ includes a condition part and an action part.

By way of example, the condition part uses the read function b) to permit the contents of the GIE to be tested for prescribed values. For example, it would be possible to test whether a particular bit (e.g., bit #1) in the GIE of a received connection-related message (e.g., IAM from the ISUP) is set. Furthermore, states of the exchange or states of the connection can be tested in the condition part. For example, it would be possible to test whether the origin of a call is national or international.

The action part of a manipulator function is executed by the APS of the exchange if the condition prescribed in the condition part has been satisfied. Optionally, the action part may itself, in turn, contain complete manipulator functions (interleaving). The action part can be used to alter states of the connection and/or states of the exchange. In this way, the action part influences the connection control. Like the condition part, the action part is stipulated administratively by the network operator.

One example of a specific action is activation of the above write function a) for a GIE containing prescribed information. Another action may be the release of the connection, for example.

Examples of configurations of manipulator functions are described by the following:

- if service code 0144 is dialed, set bit #1 in the GIE of the IAM message for this call (write function) and use tariff T (cf. service example in ~~FIGURE~~ Figure 1 to ~~FIGURE~~ Figure 3).

- If bit #1 in the GIE of the IAM message of a call is set (read function), use only direct channels and, in this context, use line reservation parameter TR=10 (cf. service example in ~~FIGURE~~ Figure 1 to ~~FIGURE~~ Figure 3).

- If a call arrives via line group with identifier W, and bit #1 in the GIE of the IAM is set, release the call and set bit #1 in the GIE of the release message (cf. ~~f~~Figure 4).

- If a call arrives via access in the company XYZ, set bit #2 in the GIE of the IAM for this call (cf. ~~f~~Figure 5).

The manipulator functions (and bit positions used therein) involved in providing a service implicitly stipulate that service or service feature for which a particular bit position is used. In this way, the whole GIE can be used for a ~~plurality~~ number of services and/or service features.

The cited manipulator functions can be administered in a user-friendly manner by the network operator~~,~~; e.g., using a programming language (cf. example in ~~FIGURE~~ Figure 3, for example). This allows the network operator to provide new services and/or service features in the network, without them needing to have already been provided in advance by the manufacturer of the exchanges.

The administrability of the cited manipulator functions in an exchange thus makes it possible

a) to have information written flexibly into generic information elements in the interoffice signaling in a VST on the basis of state conditions of the VST and of the respective connection, and

b) to evaluate information from generic information elements of the interoffice signaling in a VST and to logically combine it flexibly with actions on the basis of state conditions of the VST and of the respective connection.

Figures 1-3 show a "supersave tariff" service which can be provided, by way of example, using the present invention. By first dialing the service identifier 0144, a call is routed only via the cheapest channel. The likelihood of blocking is therefore greater than for other calls. In addition, a high trunk reservation parameter ensures that no ~~'valuable'~~ "valuable" traffic is driven out

of the network. By way of compensation, 0144 calls are charged for on the basis of a cheaper tariff T, on the other hand.

Other services and service features ~~LMs~~ which can be provided using the present invention are shown in ~~f~~Figures 4 and 5.

In summary, the following can be reiterated:

The present invention uses generic information elements GIE which can be flexibly allocated to new service features~~;~~, i.e., it is possible to administratively stipulate for a GIE, without any change of APS, those further new services or service features to be added for which the GIE or parts of the GIE (e.g., individual bit positions) is/are used. The effect achieved by this is that it is not necessary to change the protocol for interoffice signaling.

The present invention makes it possible to provide a category of services which require information to be exchanged between the exchanges, and connection control to be influenced by the exchanges themselves.

The present invention allows the connection control of a VST to be influenced without changing the APS, i.e. during operation of the VST, and thereby makes it possible to introduce new connection-related services or service features.

Although the present invention has been described with reference to specific embodiments, those of skill in the art will recognize the changes may be made thereto without department from the spirit and scope of the present invention as set forth in the hereafter appended claims.

~~Abbreviations:~~

~~APS: Installation Program System~~

~~CdPA: Called Party Address~~

~~DL: Service logic~~

~~GIE: Generic Information Element~~

~~IAM: Initial Address Message~~

~~ISUP: ISDN User Part~~

~~LE: Local VST~~

~~LM: Service feature~~

~~TE: Transit VST~~

~~VST: Exchange~~

~~Abstract~~

ABSTRACT OF THE DISCLOSURE

~~Information element component of a signaling message~~

The present invention is ~~based on the object of~~ directed toward permitting an operator to be able to introduce new services and/or service features into his/her network without them needing to have already been provided in advance in the software system of the exchanges by the manufacturer of the exchanges. ~~This object is achieved by~~ Disclosed is an information element of a signaling message which is designed such that the services or service features for which it is used can be stipulated during operation using an appropriate administration component.

Description

Information element component of a signaling message

In today's communication networks, such as the telephone network, many (connection-related) services or service features can be introduced only by virtue of a complex change of software in the exchanges (APS change). In many cases, the reason for this is, among other things, that services and service features require alteration of the signaling between the exchanges (interoffice signaling). This change includes extending existing information elements and introducing new information elements or even new messages. However, since the association between an information element of a signaling message and one or more services or service features is stipulated by means of the APS, the cited change cannot be made without a change of APS.

A previous solution for introducing particular new service features into a network (without changing the APS in the VST) is to use the IN (Intelligent Network) architecture. For many service features, an IN solution is not possible or is too expensive, however.

The present invention is based on the object of permitting an operator to be able to introduce new services and/or service features into the network without them needing to have already been provided in advance in the APS by the manufacturer of the exchanges.

This object is achieved by an information element component in accordance with claim 1 and by a method in accordance with claim 3.

An exemplary embodiment of the invention is explained in more detail below with reference to the drawing, the drawing comprising five figures.

The invention provides for the introduction of one or more generic information elements into (signaling) messages for interoffice signaling, said messages being exchanged in the context of the connection control between the exchanges in a communication network. The functional significance of a generic information element (GIE) is not stipulated by the APS. This is how GIEs differ from normal nongeneric information elements. By way of example, a generic information element (GIE) can be provided for this purpose in the connection setup message IAM from the ISUP (cf. figure 2). Such a GIE may comprise a (bit) strip of 8, 16, 24 or more bits, for example.

Setup and cleardown of connections is controlled in an exchange by the software program for connection control (part of the APS). So that the operator is able to introduce new service features and/or services into the network without changing the APS, the following functions for processing and evaluating the GIE and for influencing the connection control are provided in addition to the GIE in the exchanges in the network:

a) a write function which connection-related messages can use to write information to the GIE (e.g. setting of individual bits in a bit strip)

b) a read function which connection-related messages can use to specifically read information from the GIE (e.g. testing of individual bits in a bit strip)

c) an administration component which the network operator can use to influence the connection control of a VST.

This administration component can be used by the network operator to embed "manipulator functions" into the connection control at prescribed locations ("points in call", e.g. before or after the digit analysis of the destination telephone number). A manipulator function comprises a condition part and an action part.

By way of example, the condition part uses the read function b) to permit the contents of the GIE to be tested for prescribed values. For example, it would be possible to test whether a particular bit (e.g. bit #1) in the GIE of a received connection-related message (e.g. IAM from the ISUP) is set. Furthermore, states of the exchange or states of the connection can be tested in the condition part. For example, it would be possible to test whether the origin of a call is national or international.

The action part of a manipulator function is executed by the APS of the exchange if the condition prescribed in the condition part has been satisfied. Optionally, the action part may itself in turn contain complete manipulator functions (interleaving). The action part can be used to alter states of the connection and/or states of the exchange. In this way, the action part influences the connection control. Like the condition part, the action part is stipulated administratively by the network operator.

One example of a specific action is activation of the above write function a) for a GIE containing prescribed information. Another action may be the release of the connection, for example.

Examples of configurations of manipulator functions are described by the following:
- if service code 0144 is dialed, set bit #1 in the GIE of the

IAM message for this call (write function) and use tariff T (cf. service example in FIGURE 1 to FIGURE 3).
- If bit #1 in the GIE of the IAM message of a call is set (read function), use only direct channels and, in this context, use line reservation parameter TR=10 (cf. service example in FIGURE 1 to FIGURE 3).
- If a call arrives via line group with identifier W, and bit #1 in the GIE of the IAM is set, release the call and set bit #1 in the GIE of the release message (cf. figure 4).
- If a call arrives via access in the company XYZ, set bit #2 in the GIE of the IAM for this call (cf. figure 5).

The manipulator functions (and bit positions used therein) involved in providing a service implicitly stipulate that service or service feature for which a particular bit position is used. In this way, the whole GIE can be used for a plurality of services and/or service features.

The cited manipulator functions can be administered in a user-friendly manner by the network operator, e.g. using a programming language (cf. example in FIGURE 3, for example). This allows the network operator to provide new services and/or service features in the network, without them needing to have already been provided in advance by the manufacturer of the exchanges.

The administrability of the cited manipulator functions in an exchange thus makes it possible
a) to have information written flexibly into generic information elements in the interoffice signaling in a VST on the basis of state conditions of the VST and of the respective connection, and
b) to evaluate information from generic information elements of the interoffice signaling in a VST and

to logically combine it flexibly with actions on the basis of state conditions of the VST and of the respective connection.

Figures 1-3 show a "supersave tariff" service which can be provided, by way of example, using the invention. By first dialing the service identifier 0144, a call is routed only via the cheapest channel. The likelihood of blocking is therefore greater than for other calls. In addition, a high trunk reservation parameter ensures that no 'valuable' traffic is driven out of the network. By way of compensation, 0144 calls are charged for on the basis of a cheaper tariff T, on the other hand.

Other services and LMs which can be provided using the invention are shown in figures 4 and 5.

In summary, the following can be reiterated:

The present invention uses generic information elements GIE which can be flexibly allocated to new service features, i.e. it is possible to administratively stipulate for a GIE, without any change of APS, those further new services or service features to be added for which the GIE or parts of the GIE (e.g. individual bit positions) is/are used. The effect achieved by this is that it is not necessary to change the protocol for interoffice signaling.

The invention makes it possible to provide a category of services which require information to be exchanged between the exchanges, and connection control to be influenced by the exchanges themselves.

The invention allows the connection control of a VST to be influenced without changing the APS, i.e. during operation of the VST, and thereby makes it possible to introduce new connection-related services or service features.

Abbreviations:

APS:	Installation Program System
CdPA:	Called Party Address
DL:	Service logic
GIE:	Generic Information Element
IAM:	Initial Address Message
ISUP:	ISDN User Part
LE:	Local VST
LM:	Service feature
TE:	Transit VST
VST:	Exchange

Patent Claims

1. An information element component of a signaling message used for the signaling between exchanges in a communication network,
characterized in that
it is designed such that
   - the services or service features for which it is used can be stipulated during operation using an appropriate administration component,
   - the content values thereof can be evaluated and/or altered, on the basis of a preset made using the administration component, within the context of the processing of a connection by an exchange.

2. The information element component as claimed in claim 1,
characterized in that
the administration component makes the cited stipulation by embedding the respective information item for at least one bit position of an information element as control information item into the connection control of an exchange in order to provide a service or service feature.

3. A method for connection control in a communication network, according to which
information elements are used in signaling messages between the exchanges, in the context of which information elements the services and/or service features for which an information element is used can be stipulated administratively during operation, and in the context of which information elements the content values of the information element can be altered, on the basis of an

administrative preset, within the context of the processing of a connection by the exchange.

4. The method as claimed in claim 3, characterized in that
the cited stipulation is made by prescribing the respective information item for at least one bit position of an information element as control information for the connection control of an exchange in order to provide a service or service feature.

5. An administration component which can be used to impress on the connection control of an exchange during operation those services and/or service features for which an information element of a signaling message is used.

6. An administration component which the network operator can use to embed into the connection control at prescribed locations functions which can alter and/or evaluate content values of information elements of signaling messages.

7. A method for connection control in an exchange, according to which
(manipulator) functions can be impressed administratively on the connection control at particular (execution) locations, characterized in that
the (manipulator) functions prompt actions which can alter and/or evaluate content values of information elements of signaling messages.

8. An exchange, having
a manipulator function which can be programmed using an administration component, thereby permitting the connection control to be influenced administratively.

Service example: "Supersave tariff"

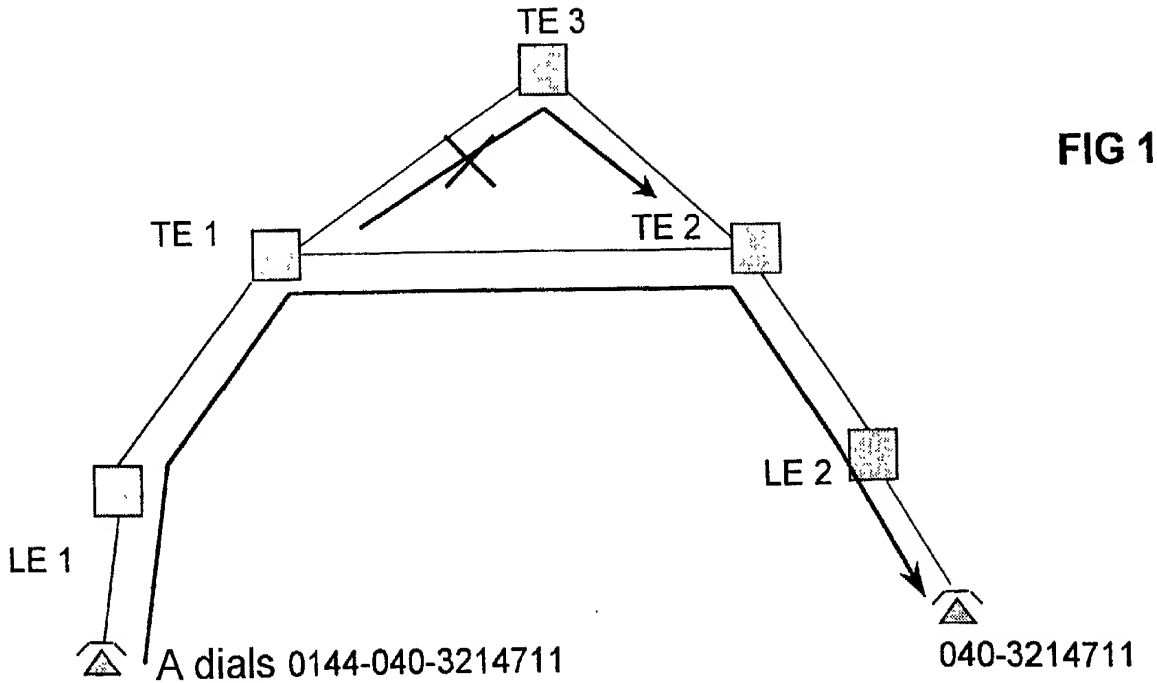
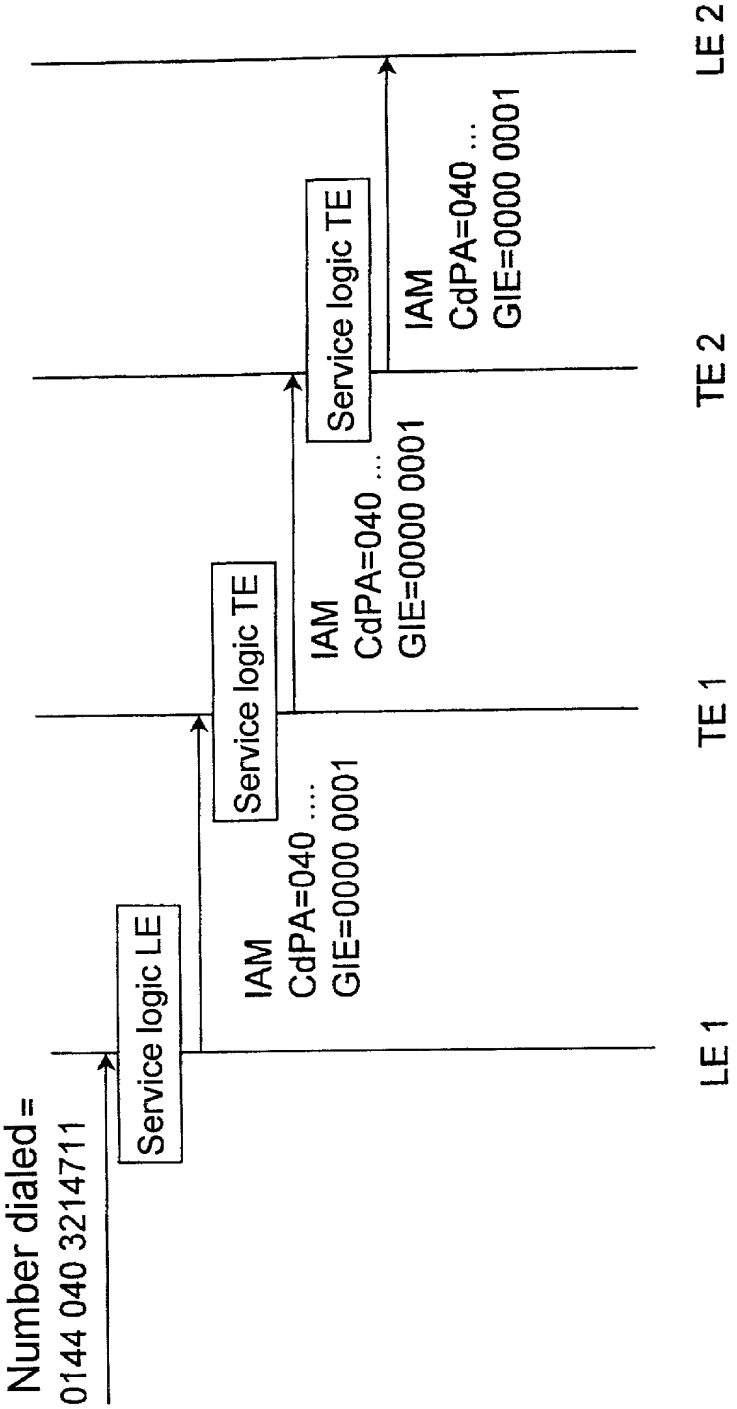


FIG 1

FIG 2



The schematic service logic

Service logic LE

```
IF
  telephone number starts with 0144
THEN BEGIN
  Set bit 1 in GIE of the IAM
  Activate supersave tariff T
END
```

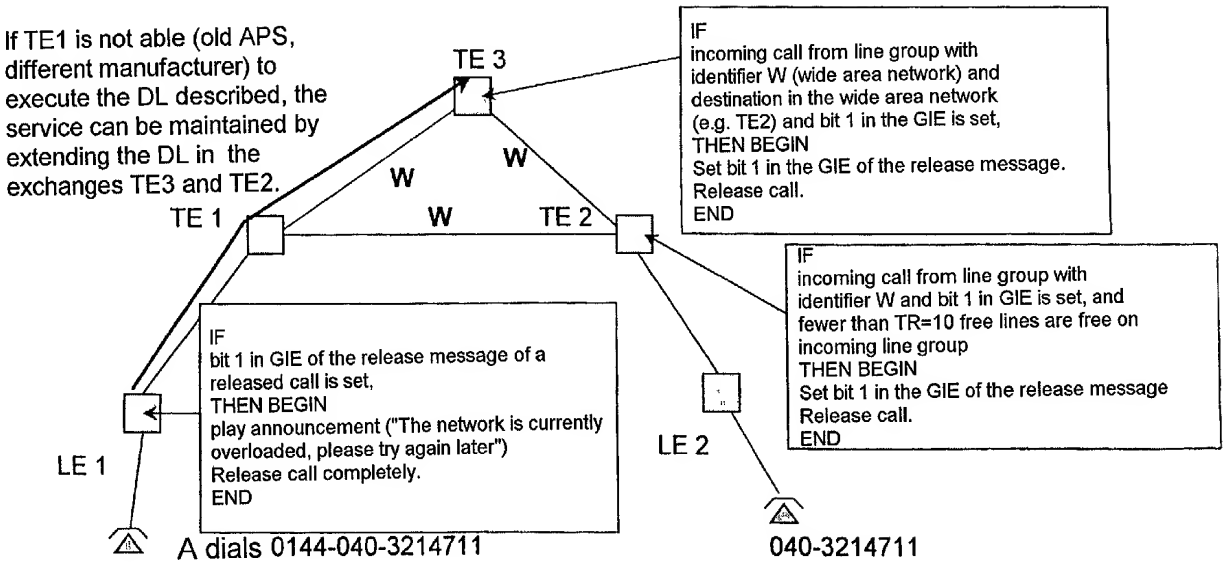
Service logic TE

```
IF
  bit 1 of GIE in IAM is set
THEN BEGIN
  Only direct channel routing
  Trunk reservation = 10
END
```

FIG 3

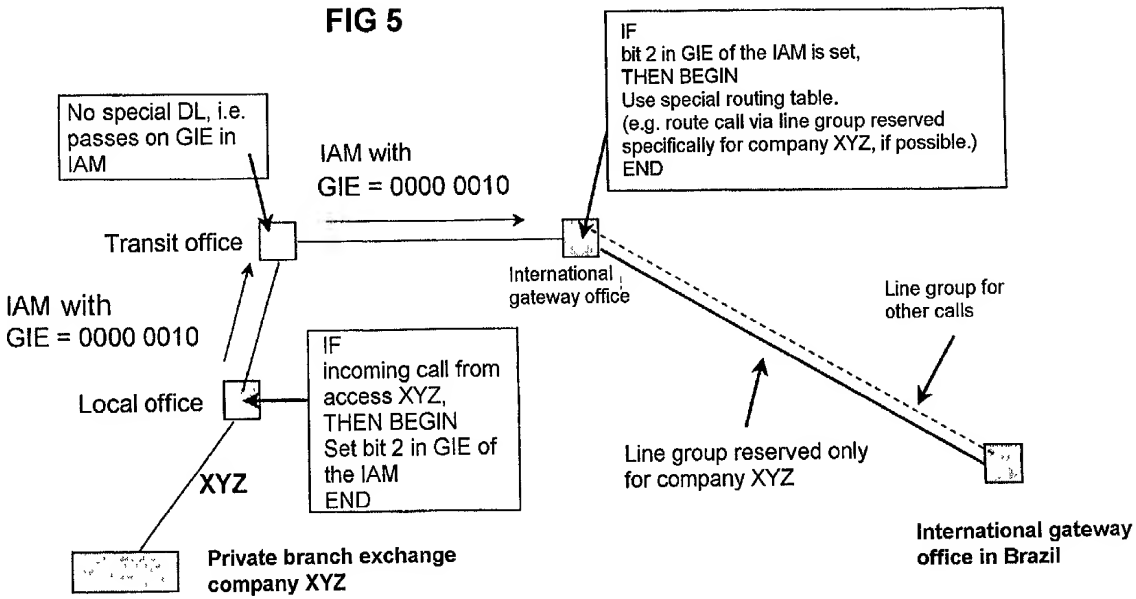
Additional service logic in TE3

FIG 4



Service example: Special routing for selected companies

FIG 5



COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY (Includes Reference to PCT International Applications) PCT/EP00/00051	ATTORNEY'S DOCKET NUMBER 112740-241

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name, I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

INFORMATION ELEMENT COMPONENT OF A SIGNALING MESSAGE, AND A METHOD FOR CONNECTION CONTROL USING SAME

the specification of which (check only one item below):

☐ is attached hereto.

☐ was filed as United States application
Serial No. 09/869,952
on July 9, 2001,
and was amended
on _____(if applicable).

☐ was filed as PCT international application
Number _____
on _____,
and was amended under PCT Article 19
on _____(if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. 119:

COUNTRY (if PCT indicate "PCT")	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 35 USC 119
European	99100455.7	11 January 1999	☐ YES ☐ NO
			☐ YES ☐ NO
			☐ YES ☐ NO
			☐ YES ☐ NO
			☐ YES ☐ NO

Combined Declaration For Patent Application and Power of Attorney (Continued) (Includes Reference to PCT International Applications) PCT/EP00/00051	ATTORNEY'S DOCKET NO. 112740-241

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject mater of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application:

PRIOR U.S. APPLICATIONS OR PCT INTERNATIONAL APPLICATIONS DESIGNATING THE U.S. FOR BENEFIT UNDER 35 U.S.C. 120:

U.S. APPLICATIONS		STATUS (Check one)		
U.S. APPLICATION NUMBER	U.S. FILING DATE	PATENTED	PENDING	ABANDONED

PCT APPLICATIONS DESIGNATING THE U.S.					
PCT APPLICATION NO	PCT FILING DATE	U.S. SERIAL NUMBERS ASSIGNED (if any)			

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

SIGNATURE OF INVENTOR 201	SIGNATURE OF INVENTOR 202	SIGNATURE OF INVENTOR 203
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DATE Oct. 5th, 2001	DATE	DATE